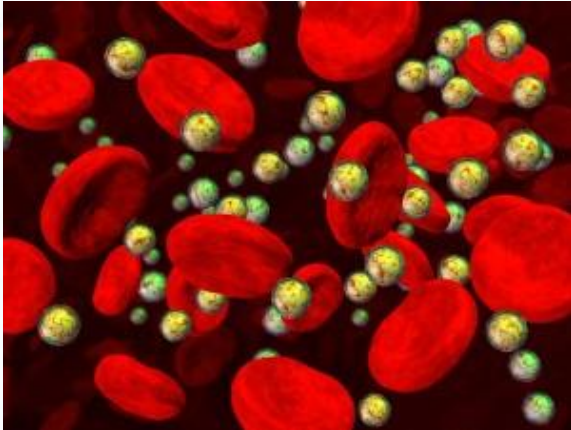


Advanced Lipid Testing



Advanced lipid testing may be recommended by your healthcare provider to optimize your cholesterol treatment. Advanced lipid tests are performed because standard cholesterol tests may not completely represent cholesterol-related risk for heart attacks and strokes. Some people—especially people with diabetes, insulin resistance, or cardiovascular disease—continue to have progression of cardiovascular disease, even when

their low-density lipoprotein (LDL) cholesterol is at goal. Advanced lipid testing is usually performed in addition to a standard cholesterol test or “lipid panel,” which measures total cholesterol, LDL cholesterol, high-density lipoprotein (HDL) cholesterol and triglycerides. Two commonly used advanced lipid tests are apolipoprotein B (apoB) and LDL particle number (LDL-P). How are advanced lipid tests performed and how often should I have testing? ApoB and LDL-P are both simple blood tests and do not require fasting. Advanced lipid testing is offered at many labs and also may be available at your healthcare provider’s office. Insurance coverage can be discussed with your healthcare provider and insurance company. Some providers recommend advanced lipid testing at the initial visit and intermittently throughout treatment. Some providers recommend advanced lipid testing after you have successfully achieved your LDL cholesterol and non-HDL cholesterol goals. What are good results and how do I achieve them? As with standard cholesterol testing, your healthcare provider may recommend a specific target number based on your risk factors. As with cholesterol goals, advanced lipid goals are reached through a combination of healthy lifestyle and cholesterol-lowering medication.

How are advanced lipid tests different from regular cholesterol tests? Cholesterol is carried in lipoprotein particles. Advanced lipid tests can be useful because some people do not have a lot of LDL cholesterol, but they have a lot of LDL particles. This can occur when they have mostly small particles or, alternatively, particles that contain less cholesterol per particle. A higher number of these lipoprotein particles make it easier for them to invade the walls of the arteries and induce a series of events that can lead to plaque formation.

The LDL particle number measures the actual number of LDL particles that carry LDL cholesterol per liter of plasma. In addition to the number of LDL particles, advanced lipid tests report the

size of these LDL particles, which may help your provider diagnose the cause of your cholesterol abnormality. For example, increased numbers of small, dense LDL particles can be caused by insulin resistance, a condition that raises your risk for developing diabetes. Understanding this information will help your healthcare provider utilize the right combination of diet and drug therapy to prevent onset or progression of disease. The apoB test measures the concentration of lipoprotein particles that have an apolipoprotein B on their surface. All of the particles that have the potential to cause disease are labeled with one molecule of apo B. ApoB, like LDL-P, can be a better measure of risk than LDL cholesterol in certain people.

Advanced Lipid Testing includes the following tests:

Apolipoprotein B (ApoB) and A1 (ApoA1):

ApoB is the primary apolipoprotein found on the surface of LDL (the carrier of “bad” cholesterol), IDL (intermediate-density lipoprotein), VLDL (very low-density lipoprotein) and Lp(a) (lipoprotein (a)). ApoB acts as a ligand for LDL receptors on various cells throughout the body thereby regulating cholesterol influx into tissues. ApoA1 is the major apolipoprotein of HDL (the carrier of “good” cholesterol) and promotes cholesterol efflux from the artery wall to the liver for excretion.

Small-Dense LDL (sdLDL) :-

LDL, which carries “bad” cholesterol, exists either as large, more buoyant particles or as smaller, more dense particles (sdLDL). sdLDL is more easily oxidized, has a higher affinity for vessel walls, and remains in the circulation longer because it is less likely to be cleared by the liver, making it more atherogenic than larger LDL particles.

Lipoprotein (a) (Lp(a)) Lp(a) is a plasma lipoprotein consisting of a cholesterol-rich LDL particle attached to an additional apolipoprotein called apo(a). Lp(a) levels are genetically determined and not affected by changes in lifestyle.

HDL2b

HDL cholesterol, like LDL cholesterol, can be divided into several subfractions, based on density, size and protein composition. The HDL2 subfraction (HDL2a, HDL2b) consists of larger, more buoyant particles while particles in the HDL3 subfraction (HDL3a, HDL3b, HDL3c) are smaller and denser. The largest and most buoyant HDL particle is HDL2b.

One primary function of HDL particles is to promote reverse cholesterol transport, or the movement of cholesterol from the tissues to the liver for excretion. HDL is first formed in the liver as the smaller HDL3 particles. Once released, the HDL3 particles travel in the blood where they receive cholesterol by various enzymatic events, eventually resulting in the formation of HDL2b particles. Assessment of HDL2b particles may provide a more powerful measure of cardiovascular risk than other HDL2 or HDL3 subfractions, individually or combined.

References:

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